What is claimed is:

1. A fill tube for a casting mold, said fill tube comprising:

a tubular member having a receiving end, a mold-engaging end and an intermediate portion extending therebetween, said mold-engaging end having a tapered flange radially extending therefrom, the remainder of said tubular member having a generally uniform cross-section.

2. The fill tube of claim 1 wherein said generally uniform cross-section of said remainder of said tubular member is generally cylindrical.

3. The fill tube of claim 1 wherein the receiving end of said fill tube is structured to receive molten metal.

4. A fill tube assembly for transferring a fluid into a casting mold, said fill tube assembly comprising:

a fill tube; and

a clamping assembly structured to maintain a substantially leak-proof seal between said fill tube and said casting mold while accommodating dimensional variations.

5. The fill tube assembly of claim 4 wherein said fill tube includes a tubular member having a receiving end, a mold-engaging end and an intermediate portion extending therebetween, said mold-engaging end having a flange radially extending therefrom, the remainder of said tubular-members having a generally uniform cross-section.

6. The fill tube assembly of claim 5 wherein said clamping assembly comprises:

an annular gasket disposed between said flange of said fill tube and said casting mold;

an annular load ring disposed over said fill tube and uniformly engaging the flange thereof;

an annular clamping plate disposed over said fill tube onto said annular load ring, said clamping plate structured to bias said load ring against said flange thereby distributing a uniform compression load against said casting mold and uniformly compressing said gasket therebetween;

a pre-load gap between said clamping plate and said casting mold, said pre-load gap sized to for said dimensional variations; and

at least one fastener structured to fasten said clamping plate to said casting mold, whereby when the at least one fastener is tightened, the pre-load gap is substantially eliminated.

7. The fill tube assembly of claim 6 wherein said at least one fastener includes a plurality of fasteners; wherein said casting mold includes a plurality of fastener-receiving apertures and a fill tube socket; and wherein said fill tube is structured for insertion into said fill tube socket.

8. The fill tube assembly of claim 7 wherein said annular clamping plate includes a plurality of fastener-receiving openings corresponding to said fastener-receiving apertures in said casting mold and structured to receive said plurality of fasteners therethrough; wherein each of said plurality of fasteners extend through said fastener-receiving openings in said clamping plate into said corresponding fastener-receiving apertures in said casting mold; and wherein tightening said plurality of fasteners tightens said annular clamping plate against said annular load ring.

9. The fill tube assembly of claim 8 wherein said annular clamping plate is structured to bend towards said casting mold when said plurality of fasteners are tightened, thereby narrowing said pre-load gap; and wherein said tightened clamping plate accommodates said dimensional variations.

10. The fill tube assembly of claim 6 wherein said fill tube flange includes a mold-engaging face and a non-engaging face; wherein the non-engaging face of said flange is tapered; wherein said annular load ring includes a flange-engaging face and a non-engaging face; and wherein said flange-engaging face is tapered to correspond with said tapered non-engaging face of said flange.

11. The fill tube assembly of claim 10 wherein the tapers of said non-engaging face of said fill tube and said flange-engaging face of said annular load ring are the same.

12. The fill tube assembly of claim 10 wherein said tapered flange-engaging face of said annular load ring is structured to self-center on said tapered

non-engaging face of said flange, thereby distributing a uniform compression load on said flange when said annular clamping plate is tightened.

13. The fill tube assembly of claim 4 wherein said assembly is structured to transfer molten metal into said casting mold.

14. A fill tube assembly structured to transfer molten metal into a casting mold while accommodating dimensional variations in said assembly, said casting mold including a fill tube socket and a plurality of fastener-receiving apertures, said fill tube assembly comprising:

a fill tube having a receiving end, a mold-engaging end and an intermediate portion extending therebetween, said mold-engaging end having a tapered flange radially extending therefrom, the remainder of said fill tube having a generally uniform cross-section; and

a clamping assembly structured to maintain a substantially leak-proof seal between said fill tube and said casting mold, said clamping assembly comprising:

an annular gasket disposed within said fill tube socket between said tapered flange of said fill tube and said casting mold;

an annular load ring, having a taper corresponding to said tapered flange, said load ring disposed over said fill tube and uniformly engaging said tapered flange thereof;

an annular dimensional compensating ring disposed over said fill tube and structured to engage said annular load ring and to establish and maintain a compressive load between said load ring and said tapered flange while accommodating said dimensional variations; and

an annular clamping plate disposed over said fill tube, said annular clamping plate including a dimensional compensating ring adjustment means and a plurality of fastener-receiving openings corresponding to said fastener-receiving apertures in said casting mold and structured to receive a plurality of fasteners therethrough, said clamping plate structured to maintain a seal between said tapered flange and said casting mold while further accommodating additional said dimensional variations.

15. The fill tube assembly of claim 14 wherein said annular clamping plate is structured to be initially spaced apart from said casting mold, in order to form a pre-load gap therebetween, said pre-load gap sized to compensate for said dimensional variations; wherein said pre-load gap is structured to narrow when said plurality of fasteners are tightened; and wherein said tightened clamping plate is structured to provide said further accommodation of said additional dimensional variations.

16. The fill tube assembly of claim 14 wherein said dimensional compensating ring adjustment means includes a threaded aperture in said clamping plate; wherein said annular dimensional compensating ring is threaded corresponding to the threads of said threaded aperture in said clamping plate; wherein said annular dimensional compensating ring is structured for threaded insertion into said threaded aperture; and wherein said dimensional compensating ring is structured to be rotated to tighten against said annular load ring in order to establish and maintain said compressive load between said load ring and said tapered flange.

17. The fill tube assembly of claim 16 wherein said fill tube flange includes a mold-engaging face and a non-engaging face; wherein the non-engaging face of said flange is tapered; wherein said annular load ring includes a flange-engaging face and a non-engaging face; and wherein said flange-engaging face is tapered to correspond with said tapered non-engaging face of said flange.

18. The fill tube assembly of claim 17 wherein the tapers of said non-engaging face of said fill tube and said flange-engaging face of said annular load ring are the same.

19. The fill tube assembly of claim 17 wherein said tapered flange-engaging face of said load ring is structured to self-center on said tapered non-engaging face of said flange, thereby distributing a uniform compression load on said flange when said clamping plate is tightened.

20. A method of employing a fill tube assembly to transfer molten metal into a casting mold, said method comprising the steps of:

providing a casting mold having a fill tube socket and a plurality of fastener-receiving apertures;

providing a fill tube assembly including a fill tube with a tapered flange and a clamping assembly structured to maintain a seal between said fill tube and said casting mold while accommodating dimensional variations, said clamping assembly including at least a gasket, a tapered load ring, a clamping plate with a plurality of fastener-receiving openings corresponding with the fastener-receiving apertures of said casting mold, and a plurality of fasteners;

inserting said fill tube into said fill tube socket, with said gasket disposed between said fill tube and said casting mold;

sliding said tapered load ring over said fill tube to engage said tapered flange thereof;

sliding said clamping plate over said fill tube onto said load ring;

providing a pre-load gap between said clamping plate and said casting mold, said pre-load gap sized to compensate for said dimensional variations;

inserting said plurality of fasteners through said fastener-receiving openings in said clamping plate and into said fastener-receiving apertures in said casting mold; and

tightening each of said plurality of fasteners, thereby tightening said clamping plate against said load ring which sealingly compresses said fill tube against said casting mold while narrowing said pre-load gap between said clamping plate and said casting mold, said tightened clamping plate accommodating said dimensional variations.

21. The method of claim 20 further comprising:

sizing said pre-load gap between said clamping plate and said casting mold at a dimension at least as large as the aggregate of all predetermined said dimensional variations in said fill tube.

22. The method of claim 20 further comprising:

providing a threaded dimensional compensating ring as an additional part of said clamping assembly, said threaded dimensional compensating ring received within a threaded aperture in said clamping plate and being structured to engage said load ring when tightened;

tightening said threaded dimensional compensating ring thereby compressing said fill tube against said casting mold while accommodating said dimensional variations; and

tightening said clamping plate, which narrows said pre-load gap, in order to further accommodate said dimensional variations.